

**East Brother Light Station Intermittent Sand Filter Wastewater Treatment Project**  
**Grant No. CBIG-42, Contract No. 02-220-550-0**

The project involves collecting waste from the island toilets, lavatories, showers and sinks using a 4 inch diameter PVC pipe. For one building, an ejector pump and force line is used. The effluent is then transported by gravity to an intermittent sand filter for biological treatment.



East Brother Island

Intermittent sand filters have been used for the purification of wastewater since their development in 1869 by Sir Edward Franklin in Great Britain. They were widely used in New England during the late 19th and early 20th Centuries but their use declined as trickling filters and activated sludge became more popular as the country urbanized.



Retaining wall prior to placement of filter aggregate

However, in recent years, there has been resurgence in their use for single residences and small communities. In the intermittent sand filter, the effluent first goes into a septic tank for primary treatment and settling, and then it is pumped through the sand filter where it percolates through and is then discharged. Intermittent sand filtration of wastewater is a

highly stable process, accepting wide variations in organic and hydraulic loading while consistently achieving a high quality effluent. Because bacteria provide the most effective treatment under aerobic conditions, aeration of the sand is insured by intermittent application of the wastewater and venting of the underdrain. The effluent is sterilized by ultraviolet light before final discharge into San Francisco Bay.

The sand filter covers approximately 200 square feet and is retained by a masonry wall that rises a maximum of 4 feet on the lower side and is flush with the grade on the higher side. The installation eventually will be visually screened by native grasses, wildflowers, shrubs and vines.



Distribution piping before installation of final aggregate cap

### **Project Status**

The facility received its final inspection and was cleared for operation by Engineer of Record, Paul Tanner, PE, on September 24, 2004. Since then, several adjustments have been made to the pump controls and float switches to achieve optimum operation.

Post construction water quality monitoring will begin October 1,

2004, and will continue weekly through the first quarter of operation.

There are a number of non-operational tasks that need to be completed to close out the construction phase of the project:

- (1) Clean up the rock and other debris resulting from the excavation. The existing wood stair was destroyed in the construction process and will be replaced by a stone stair constructed from the excavated rock. The remaining spoils will be placed around the sand filter to appear as natural as possible, and the area will be seeded with native grasses and wildflowers.
- (2) Remove the kitchen garbage disposer.
- (3) Complete repairs on existing piping that was removed or damaged during construction.
- (4) Construct compost bins for disposal of primarily vegetable-derived kitchen wastes that formerly were put down the garbage disposer.
- (5) Install piping and a grease interceptor for the kitchen dishwasher and sink.

We anticipate that this additional work will be completed before the end of October 2004.



Completed sand filter